Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Wireless Telecommunications Bureau and	)	WT Docket No. 24-240
Office of Engineering and Technology Seek	)	RM-11989
Comment on NextNav Inc. Petition for	)	
Rulemaking	)	

COMMENTS OF The Boeing Company

The Boeing Company ("Boeing" or "Company") hereby submits these comments in response to the Federal Communications Commission's ("Commission") Public Notice[1] in the above-captioned proceeding. As the United States' largest commercial aerospace manufacturer and a global aerospace company, Boeing manufactures develops, manufactures and services commercial airplanes, defense products and space systems for customers in more than 150 countries, including the U.S. government and its allies. These activities occur across all 50 states and U.S. territories. Boeing employs more than 146,000 people in the United States, supporting manufacturing, repair, maintenance and other operations. Many of these operations utilize the frequency band 902-928 MHz for Radio Frequency Identification ("RFID") purposes. Contrary to the claim by NextNav that the "Lower 900 MHz Band will continue to be underutilized,"[2] Boeing believes the 902-928 MHz band is widely used and will continue to provide significant economic benefits to the nation that are significantly greater than NextNav's proposed use.

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[1] *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on NextNav Inc. Petition for Rulemaking* ("*Public Notice*"), Public Notice, WT Docket No. 24-240 (Aug. 6, 2024).

[2] NextNav Petition for Rulemaking, Enabling Next-Generation Terrestrial Positioning, Navigation, and Timing and5G: A Plan for the Lower 900 MHz Band (902-928 MHz) ("*Petition*") at 6 (filed Apr. 16, 2024).

[2] *Public Notice* at 31.

For example, Boeing has manufacturing facilities and operations in many locations where the 902-928 MHz band is used. These include: Huntsville, Alabama; Mesa, Arizona; El Segundo, Palmdale, Victorville and Huntington Beach, California; St. Charles and St. Louis, Missouri; Portland, Oregon; Ridley Park, Pennsylvania; Charleston, South Carolina; San Antonio, Texas; Salt Lake Valley, Utah; Everett, Auburn, Moses Lake and Renton, Washington; and at the Kennedy Space Center, Florida. Boeing also utilizes RFID systems operating in the frequency band 902-928 MHz to provide logistics and services support to airline and U.S. government customers throughout the U.S. In addition, and just as important, RFID technology is used by Boeing suppliers providing parts management across the U.S.

Boeing is a significant user of RFID equipment operating in the radio frequency band 902-928 MHz. In Boeing's manufacturing and logistics operations located throughout the U.S., the Company uses RFID to track thousands of different aircraft parts and supplies, ranging from hazardous materials, such as sealants, fuels, paints and lubricants, to aircraft and satellite parts. For example, Boeing and its airline customers must ensure there is the appropriate number of life vests onboard an aircraft at all times.[3] Using a passive RFID system operating in the frequency band 902-928 MHz to track life vest serial numbers, manufacturing date, expiration date and hydrostatic test state while stowed on an aircraft is used to comply with Federal Aviation Administration safety requirements.[4] This system is more accurate and takes significantly less time to document than if a technician must manually review this data prior to every flight. In addition, RFID is used to track the location of tools and other equipment used in Boeing's operations as well. Boeing also relies on RFID to track raw materials used in the fabrication and assembly of commercial aircraft, such as the composites used to construct fuselages, as well as parts used to build many defense products. Parts that are sensitive to exposure or temperature are also monitored using RFID systems impacted by NextNav's proposal. Tracking is not limited to only Boeing locations. Boeing requires RFID tracking for many aircraft components beginning at supplier locations throughout the U.S. and world, all the way to final installation.

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[3] *See* 14 C.F.R. 91.509 (2024)

[4] Id.

Boeing has directly invested over ten million dollars to purchase and install fixed and mobile devices utilizing passive RFID capabilities operating in the frequency band 902-928 MHz. This cost does not include the cost of planning, research and development to implement these RFID systems. Because Boeing requires many of its suppliers to also utilize such RFID technology, the cost to suppliers is likely just as significant. RFID use at Boeing has been ongoing for many years, and has been an considered an integral part of operations since RFID standards were first developed in 2004.[5] The RAIN RFID protocol enables Boeing, as a worldwide enterprise, to utilize passive RFID throughout the supply chain, from raw materials to finished products delivered to customers throughout the world. As a result, the costs to the commercial aviation industry throughout Boeing's supply chain is significant, and could take over a decade to change if the Commission implements NextNav's proposal.

Because Boeing utilizes passive RFID tags throughout the manufacturing process, limiting or impacting the performance of installed readers and tags essentially renders the entire RFID system inoperative. The cost to Boeing could be in the order of tens of millions of dollars annually. This cost would be spread across the loss of the fixed and mobile equipment already deployed and the increase in labor costs to accomplish the tasks now performed by passive RFID systems. An example of this cost would be the time consuming and ergonomically challenging methods to accurately account for serialized hardware delivered to Boeing's commercial and defense customers.

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[5] EPC Air Interface Protocol, https://www.gs1.org/standards/rfid/uhf-air-interface-protocol. GS1's EPC "Gen2" air interface protocol, first published by EPCglobal in 2004 defines the physical and logical requirements for an RFID system of interrogators and passive tags operating in the frequency range 860-930 MHz. Over the past two decades, EPC Gen2 has established itself as the standard for UHF passive RFID ("RAIN RFID") implementations across the aerospace industry.

As a result, Boeing has concerns with and opposes NextNav's proposed changes to the Commission's rules, particularly the removal of the current requirement that NextNav not cause unacceptable interference to Part 15 devices.[6] Boeing is also concerned with NextNav's proposal to take away spectrum from many industries who rely on RFID to drive the U.S. economy and give it to NextNav and the cellular ("mobile-broadband") industry.[7] This change would eviscerate use of the band for critical logistics activities costing many industries tens if not hundreds of millions of dollars.

The impacts to the entire aviation and aerospace industries, as well as the other industries who rely on the RFID ecosystem, should at the outset be comprehensively addressed by NextNav before the Commission further considers its petition. The Commission's consideration of NextNav's impact on Part 15 devices is greatly appreciated. While NextNav offers to address concerns, no information has been made available to impacted users of such a radical change to the use of the band.[8] It is clear in reviewing the U.S. Department of Transportation ("DoT") contract award[9] that there are other methods to accomplish the service NextNav wants to provide. NextNav does not need to change the spectrum usage in the United States, while also impacting world-wide use of passive RFID to achieve DoT's goal.

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[6] Public Notice at 4.

[7] Petition at 4.

[8] *Id*. at 31.

[9] U.S. Department of Transportation, Department of Transportation Awards $7 million for Complementary Positioning, Navigation and Timing Technologies, July 3, 2024, https://www.transportation.gov/briefing-room/department-transportation-awards-7-million-complementary-positioning-navigation-and.

The Commission should not authorize the costly and disruptive requested changes to the critically important radio frequency band 902-928 MHz. Current regulations for this band help support the entire aviation and aerospace industries, which provide significantly more benefits to the United States than NextNav’s proposal would.

Respectfully Submitted,

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